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NASA Satellite Set For Launch, UNH-Built Sensors Onboard

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Editors and reporters: The IBEX launch will be broadcast live via NASA Select TV on Sunday, Oct. 19, 2008 beginning at 12:15 p.m. at the Institute for the Study of Earth, Oceans, and Space in Durham. UNH scientists, engineers, and students involved in the mission will be on hand.

DURHAM, N.H. -On Sunday, October 19, 2008, in skies over the Kwajalein Atoll in the South Pacific, NASA's little Interstellar Boundary Explorer (IBEX) satellite will drop from the belly of an Air Force wide-body jet onboard a Pegasus rocket and thunder into outer space. Blast-off is set for 1:45 p.m. Eastern Standard Time.

At that moment, scientists, engineers, and students from the University of New Hampshire's Space Science Center will be holding their collective breath as they watch the launch via a live feed from NASA.

Onboard IBEX, which will map the edge of our solar system for the first time, are precision instruments designed and built at UNH over the last three years under a fast-paced schedule.

The UNH team constructed critical components for the two ultra-high sensitivity cameras onboard the spacecraft. The cameras will capture incoming atoms (rather than light waves) to produce images of the region in space that marks the boundary between our solar system and the rest of our galaxy.

Says Eberhard Möbius, principal UNH scientist for the IBEX mission, "With these images, we will diagnose the surrounding interstellar gas, which represents raw material for star formation, and learn about the boundary region of the heliosphere, which is the Earth's first shield of protection against energetic cosmic radiation."

Fifty years of space exploration has provided a good understanding of near-Earth space but the region where our solar system mingles with the medium that fills our galaxy - the "space between the stars" - has not been well investigated. This is largely due to a lack of instrumentation to do the job, according Möbius. "This mission really tackles a new measurement that we could not do before," he says.

Lead scientist for the IBEX mission is David McComas of the Southwest Research Institute (SwRI) in San Antonio, Texas.

Over the last three years, the UNH team of scientists, engineers, and students built the equivalent of the iris – a device that "collimates" or precisely lines up incoming neutral atoms.

The collimator, an elaborately engineered ring of aluminum and ceramics, will focus the incoming atoms to provide a full-sky image of the edge of our solar system.

Team members at the Space Science Center also built the time-of-flight sensor system, which identifies the captured atoms by determining their mass, for one of the cameras. Additionally, two undergraduate students, Morgan O'Neill and George Clark, have worked since their freshman years helping to design and calibrate a star sensor that will pinpoint the exact direction from which the interstellar atomic particles –the mission's quarry – are traveling.

The 28-inch-tall by 38-inch-wide octagon-shaped IBEX is one of NASA's Small Explorer missions. By design these are highly focused, and less expensive than bigger satellite missions shot into space from a ground-based rocket. For example, were the satellite lofted into space with a 127-foot Delta II rocket, the launch alone would rival the cost of the entire mission.

But launch by a Pegasus rocket can only get satellites into a near-Earth orbit. For IBEX to properly do its science it must get into a highly elliptical Earth orbit that takes the spacecraft relatively close to the Moon and away from the "noise" of Earth's magnetic field. This requires a post-Pegasus kick-start that has never been tried before. Mission scientists and engineers came up with a unique delivery system that will push the satellite into its higher orbit without pushing the budget higher.

"This method will be demonstrated for the first time with IBEX so we will be opening a new means of achieving a higher Earth orbit," Möbius says. Of the mission's particular significance he adds, "Fifty years after the beginning of the space age we are about to stick our heads out of our solar system."

The 1:45 launch will be weather dependent. Links to the NASA webcast, including launch updates, will be available at <http://ibex.swri.edu/planetaria/index.shtml>.

For information about the IBEX mission, visit <http://ibex.swri.edu> or <http://www.nasa.gov/ibex>.

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Image of the mission logo is available to download:

http://www.eos.unh.edu/newsimage/ibex_lg.jpg

